

### FEATURES

#### 1. Supports magnetron and heater loads.

Capable for switching magnetron and heater loads found in microwave ovens.

#### 2. Excellent heat resistance

Ambient temperature: up to 85°C 185°F  
Certified UL coil insulation class B and class F

#### 3. High insulation resistance

Creepage distance and clearances between contact and coil:

Min. 8 mm .315 inch

Surge withstand voltage: 10,000V

#### 4. Low operating power

Nominal operating power: 400mW/  
200mW (High sensitive type)

#### 5. A wide variety of types

Product line consists of 4 types with different shapes and pins

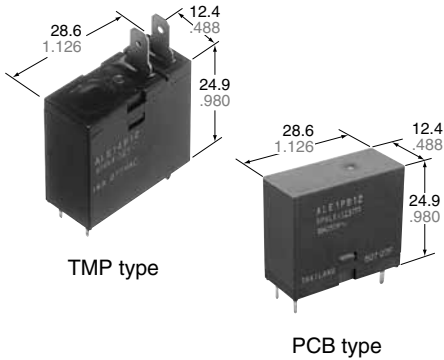
#### 6. Conforms to the various safety standards:

UL/CSA, TÜV, VDE approved and SEMKO available (TMP type)

UL/CSA, VDE approved (PCB type)

### TYPICAL APPLICATIONS

- Microwave ovens
- Refrigerators
- OA equipment



RoHS Directive compatibility information  
<http://www.mew.co.jp/ac/e/environment/>

### SPECIFICATIONS

Contact		Coil		Characteristics	
Arrangement		1 Form A		Max. operating speed (at rated load)	
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		100 mΩ		20 cpm	
Contact material		AgSnO <sub>2</sub> type		Initial insulation resistance*1	
Rating (resistive load)	Nominal switching capacity	16 A 277 V AC		Initial breakdown voltage*2	Between open contacts
	Max. switching power	4,432 V A			Between contacts and coil
	Max. switching voltage	277 V AC		1,000 Vrms for 1 min.	
	Max. switching current	16 A		4,000 Vrms for 1 min.	
	Min. switching capacity*1 (Reference value)	100 mA, 5 V DC		Initial surge voltage between contact and coil*3	
Expected life (min. operations)	Mechanical (at 180 cpm)	2 × 10 <sup>6</sup>		Operate time*4 (at nominal voltage) (at 20°C 68°F)	
	Electrical (at 20 cpm) (Resistive load)	10 <sup>5</sup>		Max. 20ms	
				Release time (with diode)*4 (at nominal voltage) (at 20°C 68°F)	
				Temperature rise (at nominal voltage) (resistance method, contact current 16 A, 20°C 68°F)	
				Max. 55°C Max. 45°C (200 mW type)	
				Shock resistance	
				Functional*5	200 m/s <sup>2</sup> {20 G}
				Destructive*6	1,000 m/s <sup>2</sup> {100 G}
				Vibration resistance	
				Functional*7	10 to 55Hz at double amplitude of 1.5mm
				Destructive	10 to 55Hz at double amplitude of 1.5mm
				Conditions for operation, transport and storage*8 (Not freezing and condensing at low temperature)	
				Ambient temp.	-40°C to +85°C -40°F to +185°F
				Humidity	5 to 85% R.H.
				Unit weight	
				Approx. 17 g .60 oz Approx. 15 g .53 oz (PCB type)	

#### Remarks

- \* Specifications will vary with foreign standards certification ratings.  
\*1 Measurement at same location as "Initial breakdown voltage" section.  
\*2 Detection current: 10mA  
\*3 Wave is standard shock voltage of ±1.2 × 50μs according to JEC-212-1981  
\*4 Excluding contact bounce time.  
\*5 Half-wave pulse of sine wave: 11 ms; detection time: 10 μs  
\*6 Half-wave pulse of sine wave: 6 ms  
\*7 Detection time: 10 μs  
\*8 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT .

## ORDERING INFORMATION

Ex. A LE 1 2 B 12

Product name	Contact arrangement	Terminal shape	Coil insulation class	Coil voltage, V DC	
LE	1: 1 Form A (400 mW) 7: 1 Form A (200 mW)	2: TMP type/PCB side three terminals (includes one dummy terminal) 3: TMP type/PCB side three terminals 4: TMP type/PCB side four terminals P: PCB type (No tab terminals)	B: Class B insulation F: Class F insulation	05: 5 06: 6 09: 9 12: 12	18: 18 24: 24 48: 48

UL/CSA, TÜV, VDE approved type is standard (TMP type). SEMKO approved types are also available, please consult us.

UL/CSA, VDE approved type is standard (PCB type).

Note: Standard packing; Carton: 100 pcs. Case 500 pcs.

## TYPES

## 1. Standard type

Contact arrangement	Coil voltage, V DC	TMP type/PCB side three terminals (includes one dummy terminal)	TMP type/PCB side three terminals	TMP type/PCB side four terminals	PCB type (No tab terminals)
		Part No.	Part No.	Part No.	Part No.
1 Form A	5	ALE12O05	ALE13O05	ALE14O05	ALE1PO05
	6	ALE12O06	ALE13O06	ALE14O06	ALE1PO06
	9	ALE12O09	ALE13O09	ALE14O09	ALE1PO09
	12	ALE12O12	ALE13O12	ALE14O12	ALE1PO12
	18	ALE12O18	ALE13O18	ALE14O18	ALE1PO18
	24	ALE12O24	ALE13O24	ALE14O24	ALE1PO24
	48	ALE12O48	ALE13O48	ALE14O48	ALE1PO48

O: Input the following letter. Class B: B, Class F: F

## 2. High sensitive type

Contact arrangement	Coil voltage, V DC	TMP type/PCB side three terminals (includes one dummy terminal)	TMP type/PCB side three terminals	TMP type/PCB side four terminals	PCB type (No tab terminals)
		Part No.	Part No.	Part No.	Part No.
1 Form A (High sensitivity: 200mW)	5	ALE72O05	ALE73O05	ALE74O05	ALE7PO05
	6	ALE72O06	ALE73O06	ALE74O06	ALE7PO06
	9	ALE72O09	ALE73O09	ALE74O09	ALE7PO09
	12	ALE72O12	ALE73O12	ALE74O12	ALE7PO12
	18	ALE72O18	ALE73O18	ALE74O18	ALE7PO18
	24	ALE72O24	ALE73O24	ALE74O24	ALE7PO24
	48	ALE72O48	ALE73O48	ALE74O48	ALE7PO48

O: Input the following letter. Class B: B, Class F: F

## COIL DATA (at 20°C 68°F)

## 1. Standard type

Nominal voltage, V DC	Pick-up voltage, V DC (max.) (at 20°C 68°F)	Drop-out voltage, V DC (min.) (at 20°C 68°F)	Coil resistance, Ω (±10%) (at 20°C 68°F)	Nominal operating current, mA (±10%) (at 20°C 68°F)	Nominal operating power, mW (at 20°C 68°F)	Maximum allowable voltage, V DC (at 20°C 68°F)
5	3.75	0.25	63	80	400	7.25
6	4.5	0.3	90	66.7		8.7
9	6.75	0.45	203	44.4		13.05
12	9	0.6	360	33.3		17.4
18	13.5	0.9	810	22.2		26.1
24	18	1.2	1,440	16.7		34.8
48	36	2.4	5,760	8.3		69.6

# LE (ALE)

## 2. High sensitive type

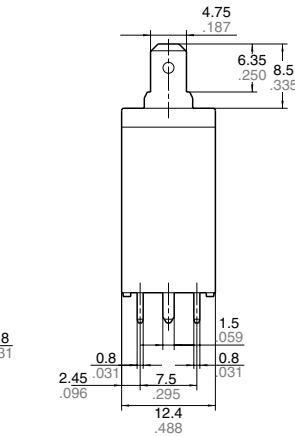
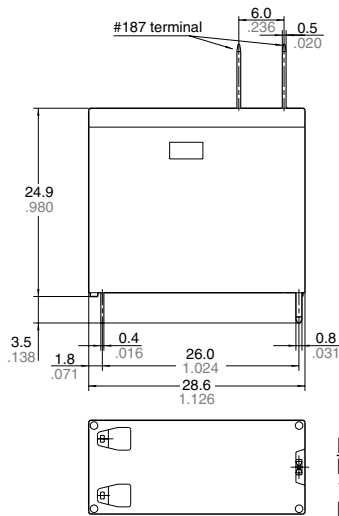
Nominal voltage, V DC	Pick-up voltage, V DC (max.) (at 20°C 68°F)	Drop-out voltage, V DC (min.) (at 20°C 68°F)	Coil resistance, Ω (±10%) (at 20°C 68°F)	Nominal operating current, mA (±10%) (at 20°C 68°F)	Nominal operating power, mW (at 20°C 68°F)	Maximum allowable voltage, V DC (at 20°C 68°F)
5	3.75	0.25	125	40	200	7.25
6	4.5	0.3	180	33.3		8.7
9	6.75	0.45	405	22.2		13.05
12	9	0.6	720	16.7		17.4
18	13.5	0.9	1,620	11.1		26.1
24	18	1.2	2,880	8.3		34.8
48	36	2.4	11,520	4.2		69.6

## DIMENSIONS

mm inch

### 1. TMP type

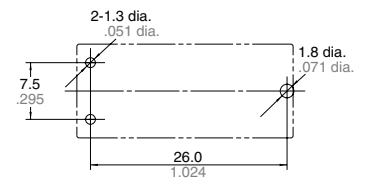
PCB side three terminals  
(includes one dummy terminal)



**Dimension:**  
 Max. 1mm .039 inch:  
 1 to 3mm .039 to .118 inch:  
 Min. 3mm .118 inch:

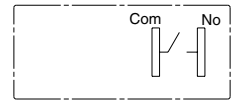
**Tolerance**  
 ±0.1 ±.004  
 ±0.2 ±.008  
 ±0.3 ±.012

PC board pattern (Bottom view)

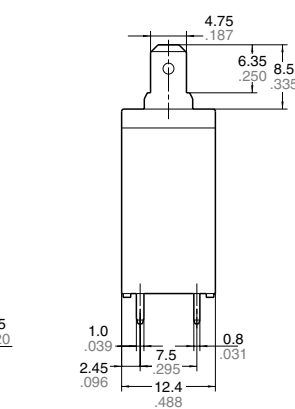
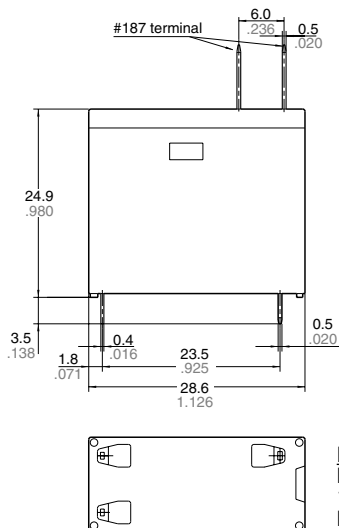


Tolerance : ±0.1 ±.004

Schematic (Bottom view)



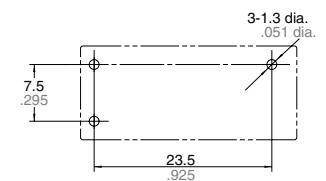
PCB side three terminals



**Dimension:**  
 Max. 1mm .039 inch:  
 1 to 3mm .039 to .118 inch:  
 Min. 3mm .118 inch:

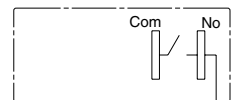
**Tolerance**  
 ±0.1 ±.004  
 ±0.2 ±.008  
 ±0.3 ±.012

PC board pattern (Bottom view)



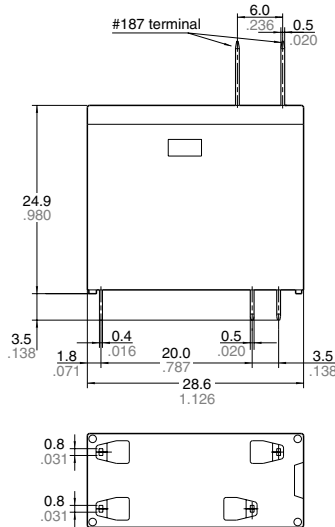
Tolerance : ±0.1 ±.004

Schematic (Bottom view)



PCB side four terminals

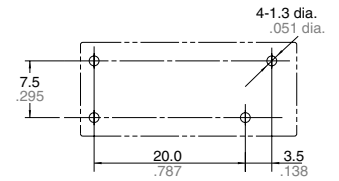
mm inch



**Dimension:**  
 Max. 1mm .039 inch:  
 1 to 3mm .039 to .118 inch:  
 Min. 3mm .118 inch:

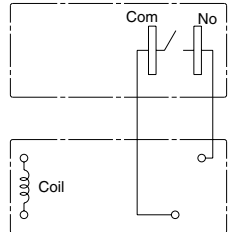
**Tolerance**  
 $\pm 0.1 \pm .004$   
 $\pm 0.2 \pm .008$   
 $\pm 0.3 \pm .012$

PC board pattern (Bottom view)

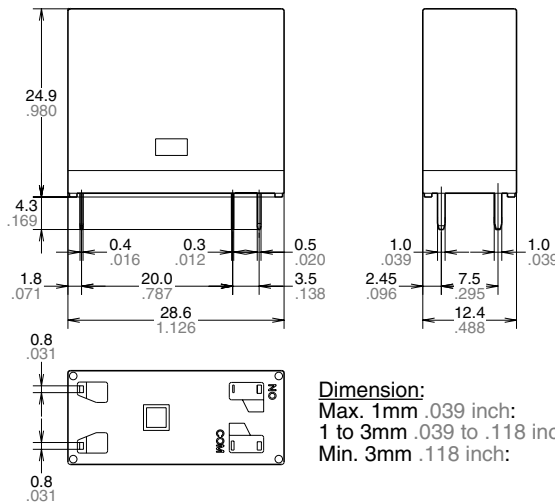


Tolerance :  $\pm 0.1 \pm .004$

Schematic (Bottom view)



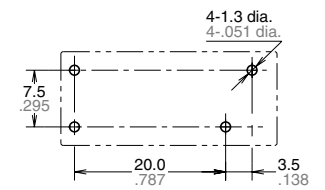
## 2. PCB type (No tab terminals)



**Dimension:**  
 Max. 1mm .039 inch:  
 1 to 3mm .039 to .118 inch:  
 Min. 3mm .118 inch:

**Tolerance**  
 $\pm 0.1 \pm .004$   
 $\pm 0.2 \pm .008$   
 $\pm 0.3 \pm .012$

PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm .004$

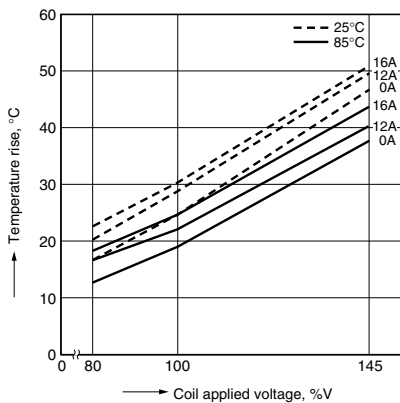
Schematic (Bottom view)



## REFERENCE DATA

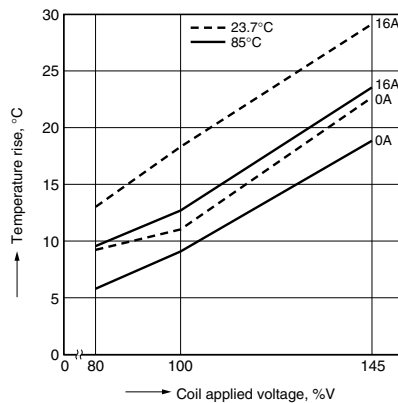
### 1-1. Coil temperature rise (400mW type)

Sample: ALE14B12, 6 pcs.  
 Point measured: coil inside  
 Ambient temperature: 25°C 77°F, 85°C 185°F

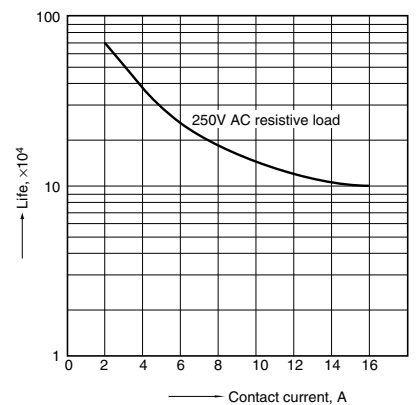


### 1-2. Coil temperature rise (200mW type)

Sample: ALE74B12, 6 pcs.  
 Point measured: coil inside  
 Ambient temperature: 23.7°C 74.66°F, 85°C 185°F



### 2. Life curve



# LE (ALE)

## 3. Electrical life test (16 A 277 V AC, resistive load)

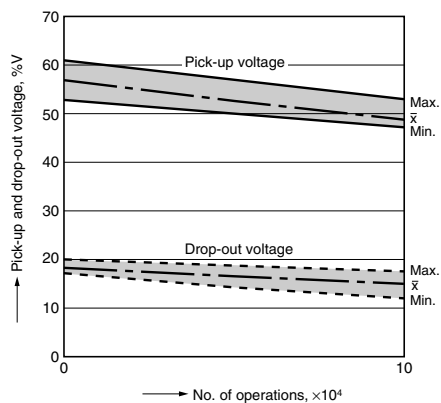
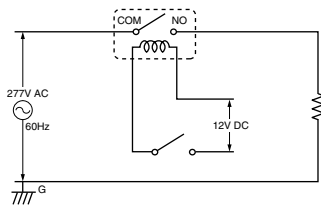
Sample: ALE14B12, 6 pcs.

Operation frequency: 20 times/min.

(ON/OFF = 1.5s: 1.5s)

Ambient temperature: Room temperature

Circuit:



**For Cautions for Use, see Relay Technical Information.**